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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Office of the Secretary Of Defense	Date: February 2018
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603920D8Z I <i>Humanitarian De-mining</i>											
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	57.464	9.740	10.837	11.347	-	11.347	10.820	11.031	11.267	11.260	Continuing	Continuing
920: <i>Humanitarian De-mining</i>	57.464	9.740	10.837	11.347	-	11.347	10.820	11.031	11.267	11.260	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Under the Office of the Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict (OASD SO/LIC), the Humanitarian Demining Research and Development (HD R&D) program element develops, demonstrates and validates cost-effective technologies for use in humanitarian demining via operational field evaluations in support of Geographical Combatant Commands (GCC) Humanitarian Mine Action (HMA) goals and objectives.

The HD R&D Program works closely with the GCCs and the Humanitarian Demining Training Center (HDTC) to craft a research and development plan that supports GCC HMA program plans and strategic objectives and enhances mil-to-mil partnerships in key regional states and provides access to live mines/UXO around the world for operational test data collection unavailable to any other DoD organization. The HD R&D Program accomplishes the GCC support by utilizing host nation demining partners to evaluate technology in actual minefields to simultaneously achieve HMA objectives and identify performance parameters; data is delivered to the US military countermining R&D programs to inform future investment decisions. In addition to the improvements made to technologies used by U.S. forces and to the reduction of landmine and UXO threat to US forces and host nation population, the Program's technology trainings and evaluations build mine action capacity and capability within mine-affected countries and improve safety, stability and economic development.

Since 1995 the program has fielded technologies for 202 evaluations in 39 countries, including Afghanistan, Iraq, Vietnam, Cambodia, Angola and Zimbabwe. The program's technologies have cleared 46.7 million square meters of the world's toughest minefields; and found or destroyed 186,000 mines and UXO.

New technology requirements and areas of emphasis are identified and validated at a biennial Requirements Workshop and a biennial UXO Working Group Meeting held by OASD SO/LIC. The meetings involve representatives from Department of State (DOS), GCC Humanitarian Mine Action offices, mine action organizations and mine-affected nations. The program element's work fulfills the Department of Defense's strategic guidance to address instability and reduce the demand for significant US force commitments to stability operations; with DODI 3000.05 to foster security, economic security and development, and build indigenous capacity; and with § 407 and CJCSI 3207.01C to reduce the social, economic and environmental impact of landmines and unexploded ordnance.

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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	
Previous President's Budget	10.007	10.837	11.347	0.000	11.347	
Current President's Budget	9.740	10.837	11.347	0.000	11.347	
Total Adjustments	-0.267	0.000	0.000	0.000	0.000	
• Congressional General Reductions	-	-				
• Congressional Directed Reductions	-	-				
• Congressional Rescissions	-	-				
• Congressional Adds	-	-				
• Congressional Directed Transfers	-	-				
• Reprogrammings	-	-				
• SBIR/STTR Transfer	-	-				
• Internal Adjustments	-0.267	-	-	-	-	
Change Summary Explanation						
Reductions were in support of Departmental efficiencies and economic assumptions.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Title: 0603920D8Z - SO/LIC Humanitarian De-mining				9.740	10.837	11.347
Description: The HD R&D Program adapts commercial-off-the-shelf equipment, integrates mature technologies, and leverages R&D activity within DoD, particularly in the Army's Night Vision and Electronic Sensors Directorate (NVESD) Tactical Countermine mission area. The program aims to improve existing technologies for: mine/unexploded ordnance (UXO) detection, technical survey/area reduction, mechanical mine/UXO clearance, underwater UXO detection and clearance, vegetation clearance, mechanical mine neutralization, and post-clearance quality control (QC).						
FY 2018 Plans:						
Deploy new technology, including Ferex to Israel; Armored Operator Station, Empact, and improvements to Piranha to Cambodia; Little Storm, HSTAMIDS and Bearcat to Colombia; and Traxx to Ukraine						
• Develop new technology for mine clearance in Iraq and Colombia						
• Complete ongoing equipment developments/modifications and test technology including Advanced Positioning System, Delta, Empact 3D, VMX10, UPEX-745, CMD-3, Primetech, and Little Storm						
• Continue successful operational evaluations from FY2017						
• Support the combatant commands and Embassy staffs by conducting new site surveys and country assessments in Vietnam, Chile, Colombia, Laos, and Ukraine						
• Develop, test and evaluate new prototype technologies based on feedback from the field						
FY 2019 Plans:						

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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603920D8Z <i>I Humanitarian De-mining</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> • Deploy new technology to Colombia, Iraq and other countries • Complete ongoing equipment developments/modifications • Continue successful operational evaluations from FY2017 • Support the combatant commands and Embassy staffs by conducting new site surveys and country assessments • Develop, test and evaluate new prototype technologies based on feedback from the field in the following areas: technical survey, individual mine/UXO and minefield detection, mechanical mine/UXO and vegetation clearance, underwater UXO detection and clearance, mechanical mine neutralization, and post-clearance QA <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Increase from FY18 to FY19 due to inflation.</p>				
Accomplishments/Planned Programs Subtotals		9.740	10.837	11.347
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
E. Acquisition Strategy Following a rapid prototyping strategy, the program emphasizes the use/modification of existing, commercially-available equipment and components to build functional prototype equipment suited for humanitarian demining operations. This approach is required due to the immediate need for new demining technologies in the face of ongoing U.S. forces and host nation citizen casualties in mine-affected countries. The program evaluates prototype equipment by acquiring it off-the-shelf from industry using competition to the extent possible, by leveraging ongoing countermine R&D efforts in other U.S. and foreign R&D activities, and by taking advantage of extensive in-house fabrication capabilities at the Army's Night Vision and Electronic Sensors Division (NVESD).				
F. Performance Metrics Long Term Strategies: Obtain adequate funding to support critical shortfalls; prioritize proposals that are deemed acceptable and allocate funding accordingly; and establish outreach programs to leverage institutional knowledge and expertise. Performance Indicator and Rating: FY 2017 Target: 90% of currently funded research technologies are completed on time and within budget Complete scheduled R&D project tasks Transition field-ready technologies to host nation demining partners FY 2018 Target:				

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90% of currently funded research technologies are completed on time and within budget Complete scheduled R&D project tasks Transition field-ready technologies to host nation demining partners Conduct biennial Humanitarian R&D Program Requirements Workshop FY 2017 Performance Rating: Funded research technologies were completed per the target. Verification: The Humanitarian Demining Program performs program reviews with other USG agencies (DOS PM WRA, DSCA, HDTC, CENTCOM, PACOM, SOUTHCOM, AFRICOM, EUCOM) and has oversight from OSD SO/LIC. Validation: Completed R&D products increase the capabilities of the DoD to effectively perform demining missions.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Office of the Secretary Of Defense **Date:** February 2018

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603920D8Z / Humanitarian De-mining	Project (Number/Name) 920 / Humanitarian De-mining
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	RDECOM-NVESD : Ft Belvoir, VA	34.099	5.116		5.796		6.095		0.000		6.095	-	-	-
Subtotal			34.099	5.116		5.796		6.095		0.000		6.095	-	-	N/A

Remarks
The HD R&D Program adapts commercial-off-the-shelf equipment, integrates mature technologies, and leverages R&D activity within DoD, particularly in the Army's Night Vision and Electronic Sensors Directorate (NVESD) Tactical Countermining mission area.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Humanitarian Demining Research and Development Program	Various	RDECOM-NVESD : Ft Belvoir, VA	21.634	4.354		4.770		4.980		0.000		4.980	-	-	-
Subtotal			21.634	4.354		4.770		4.980		0.000		4.980	-	-	N/A

Remarks
Evaluations of HD R&D Program-developed technologies in actual minefields are conducted by host nation demining partners (foreign military, non-governmental organizations and mine action centers) and provide valuable data for US military countermining R&D and next generation HD technology developments while directly contributing to world-wide mine and UXO clearance.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Humanitarian Demining Program Management Support	Various	RDECOM-NVESD : Ft Belvoir, VA	1.731	0.270		0.271		0.272		0.000		0.272	-	-	-
Subtotal			1.731	0.270		0.271		0.272		0.000		0.272	-	-	N/A

Remarks
The HD R&D Program managers oversee adaptation of commercial-off-the-shelf equipment, integration of mature technologies, and leverage of R&D activity within DoD, particularly in the Army's Night Vision and Electronic Sensors Directorate (NVESD) Tactical Countermining mission area. Areas of emphasis are identified and validated at a

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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603920D8Z / <i>Humanitarian De-mining</i>	Project (Number/Name) 920 / <i>Humanitarian De-mining</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
biennial Requirements Workshop held by OASD SO/LIC. The Requirements Workshop involves representatives from Department of State (DoS), U.S. combatant commands (COCOMS) and mine-affected nations.															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			57.464	9.740		10.837		11.347		0.000		11.347	-	-	N/A

Remarks

The Humanitarian Demining Research and Development (HD R&D) program element rapidly develops, demonstrates and validates new technologies for DoD-supported nations to detect and clear landmines and unexploded ordnance (UXO), and to contribute to US military countermining R&D. The HD R&D Program focuses on development of new technologies to improve the efficiency and safety of indigenous nation-conducted, post-conflict clearance of residual mines and UXO, which pose a serious threat to US forces conducting stability operations, and to the host nation's population and economy.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Office of the Secretary Of Defense			Date: February 2018
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	FY17				FY18				FY19				FY20				FY21				FY22				FY23			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mine / UXO Technology Development																												
Contracting Process	■				■				■				■				■				■				■			
Develop Prototype Equipment	■				■				■				■				■				■				■			
Technical Evaluation	■				■				■				■				■				■				■			
Operational Field Evaluations	■																											
Requirements Working Group Meetings			▲				▲				▲				▲				▲				▲				▲	

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Office of the Secretary Of Defense			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603920D8Z / Humanitarian De-mining	Project (Number/Name) 920 / Humanitarian De-mining	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mechanical Mine/UXO Clearance Systems	1	2017	4	2023
Mine/UXO Detection Systems	1	2017	4	2023